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**I-20123 Milano(IT)**(54) **Control apparatus for yarn twisting machine.**

(57) A control apparatus for yarn twisting machines comprising a control panel provided with electrical devices (31' - 46') for setting the speed of the units (18, 22, 29) for feeding, taking up and winding up the yarn (11), which devices are provided on one side of the control panel (48) and are aligned with respective digital displays (32, 36, 42) and with relative symbols indicative of the arrangement of the various working units (18, 22, 29) of the twisting machine. A main control device (47') enables all of the working units to be set simultaneously, while leaving the relative speed ratios unchanged.

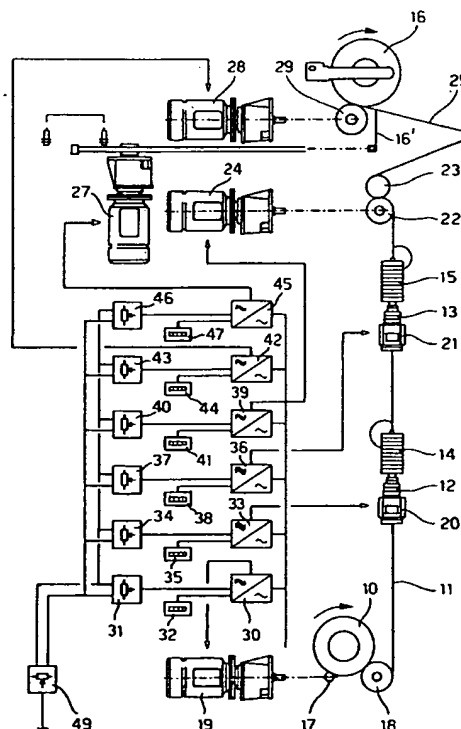


FIG. 1

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The present invention relates to a control apparatus for yarn twisting or wrapping machines and the like, and in particular concerns an apparatus provided with electrical or electronic devices for setting the speed of the individual working units for supplying, taking-up and winding-up the yarn in each working section of the twisting machine, by means of which it is possible to provide a continuous and immediate indication of the various working speeds correlated to a working diagram illustrating the various unit of the working sections of the twisting machine being monitored.

As is known for example from US-A-4.197.696, in a yarn twisting or wrapping machine, the core yarn which is unwound from a bobbin is supplied through one or more hollow spindles so as to be covered with at least one covering yarn and is then take up and rewound onto a spool. The textile machine usually is provided with several twisting or wrapping sections, in which each section comprises superimposed working units such as a bobbin for supplying the core yarn the spindle for the strand or covering yarn spindles, the take-up rollers, a yarn guide means which ensure distribution on the upper winding-up spool and the winding-up spool itself which actuated by separate control motors which must be suitably controlled and regulated so as to obtain the correct working speeds for supplying, wrapping, taking-up and winding the yarn, in accordance with the characteristic of the machine and the yarns used.

In the case of twisting or wrapping machines of the abovementioned kind, there exists the need for a device for controlling and setting the speeds of the various working units of the machine by means of which the operator is able to obtain an immediate visual and related indication of both the speed which has been set and the unit being monitored, by operating control knobs. Therefore the main object of present invention is to provide a control apparatus for the above referred purpose.

A further object of the present invention is to provide a control apparatus for twisting machines, as mentioned above, which, in addition to allowing the speed of the individual unit of the machine to be adjusted, also allows the machine as a whole to be controlled by operating a single main control device, while leaving unchanged the relative speed ratios of the working units being monitored.

All of the above can be obtained by means of a control apparatus for twisting or wrapping machines comprising the characteristic features of the main claim.

The apparatus for controlling twisting machines according to the present invention will be illustrated in greater detail hereinbelow with reference to the accompanying drawings, in which:

Fig. 1 is a general diagram of the apparatus;

Fig. 2 is a view of the control panel.

As shown in Figure 1, a twisting machine in general comprises, in each working section, a bobbin 10 from which a core yarn 11 to be covered, is unwound and is fed through one or two hollow spindles 12, 13 so as to have spirally wound around it a covering yarn or strand unwound from spools 14, 15 provided on the above mentioned spindles 12 and 13; the covered yarn 25 is then take-up by rolles 22, 23 and wound onto an upper take-up spool 16.

The lower bobbin 10 containing the core yarn to be covered is designed and made to rotate to feed the core yarn at a predetermined supply speed, by means of rollers 17, 18, the roller 17 being suitably connected to a control motor 19; Similarly, in a manner known per se, the spindles 12 and 13 of the machine are respectively made to rotate at predetermined speeds by means of a tangential belt control device 20 and 21, connected to respective control motors.

The covered yarn 25 leaving the upper spindle is take up by a pair of rollers 22, 23, the lower one 22 being similarly connected to a respective control motor 24.

The covered yarn 25 which must be wound onto the upper taking-up spool 16 is distributed moreover uniformly on the latter by means of a yarn guide 26 made to reciprocate by a drive motor 27, while 28 denotes the motor operating the roller 29 which drives in rotation the taking-up spool 16.

Each drive motor of the twisting machine may be set so as to vary the working speed, i.e. the speed at which the yarn is supplied, drawn and taken-up by spools 16, in accordance with the functional and constructional characteristics of the machine as well as in accordance with the characteristics of the same yarn. Each motor is of the asynchronous type and regulation of its rotational speed may be obtained by simply setting the value or the frequency of the electrical power source 50. This may be achieved for example by supplying power to each individual motor via a continuously settable power inverter or frequency converter comprising a respective potentiometric control device provided on a main control pannel 48 shown in Figure 2.

In particular, as shown, the motor 19 driving the rollers for unwinding the core yarn 11 is powered via an inverter 30 which can be set by means of a potentiometric circuit 31, while 32 denotes a digital display connected to an output of the inverter 30 capable of supplying a signal providing a numerical indication or data of the speed at which the yarn 11 is supplied.

Similarly 33, 34 and 35; 36, 37 and 38; 39, 40 and 41; 42, 43 and 44; and 45, 46 and 47 indicate,

respectively the power inverters, the potentiometric adjusting devices and the digital displays for indicating the number of revolutions of the spindles 12, 13 the taking-up speed, the number of reciprocations of the yarn guide 26 and the speed at which the yarn is wound on the upper spool 16.

Finally, 49 in Figure 1 denotes a main potentiometric device from which the power supply for the potentiometric devices 31, 34, 37, 40, 43 and 46 is obtained, so as to allow single setting of all the working units of the machine, while keeping the relative speed ratios unvaried.

According to the present invention as shown in Figure 1, the various potentiometric devices 49, 31, 34, 37, 40, 43 and 46 can be actuated from a main panel 48 via respective control knobs 47', 31', 34', 40', 43' and 46' aligned along one edge of the panel. Alongside each knob controlling the potentiometric devices 31 to 46, on the same panel 48 there are provided respective displays 32, 35, 38, 41, 44 and 47, each having along side it graphical symbol of the corresponding working unit of the machine being monitored, as per the diagram shown on the opposite side of the panel in the same Figure 2.

In this way the operator is able to obtain an immediate indication by which it is possible to correlate both the working data and the symbol of the working unit which he is monitoring.

This arrangement, on a common panel, of the potentiometric devices for regulating the motors, and the displays showing the yarn supply speed the taking up speed as well as the rotational speed of the spindles, in combination with a graphic representation of the individual units monitored, greatly aids the operator in that it provides a direct visual indication, in the form of symbols, of each group being monitored. In this way, the twisting machine is provided with a control panel which is extremely simple and practical in use, something which is not possible with other previously known computerized or electrical control systems and all at a considerably lower cost.

#### Claims

1. A control apparatus for a twisting machine of the type comprising working sections having correlated working units (17, 12, 13, 22, 26, 29) for unwinding a core yarn (11) from a respective yarn delivering bobbin (10), respectively for feeding a strand or covering yarn to be wrapped around said core yarn passing through hollow at least one spindle rotatably supporting a spool (14, 15) of said strand, as well as for picking and reciprocally distributing said core yarn wrapped by said strand onto a winding-up spool (16) each of said working

units (17, 12, 13, 22, 26, 29) being connected to a respective drive motor (19, 20, 21, 24, 27, 28) and manually operable control means to regulate the speed of said drive motor, characterized by comprising a control panel (48), a set of potentiometric control device (31, 34, 37, 40, 43, 46) aligned and operable on said panel, said control devices being connected to settable feeding circuits (30, 33, 36, 39, 42, 45) for said drive motors; display means (32, 35, 38, 41, 44, 47) to indicate working data of said unit, said display means being aligned on said control panel (48) alongside a respective control device, and graphical symbols representing said working units (10, 12, 13, 22, 26, 16) on said panel (48) said graphical symbols being aligned alongside a respective display means.

2. A control apparatus according to claim 1, characterized in that the potentiometric control devices for setting the working speeds of the individual working units (10, 12, 13, 22, 26, 29) are powered via a single main potentiometric setting device (49).

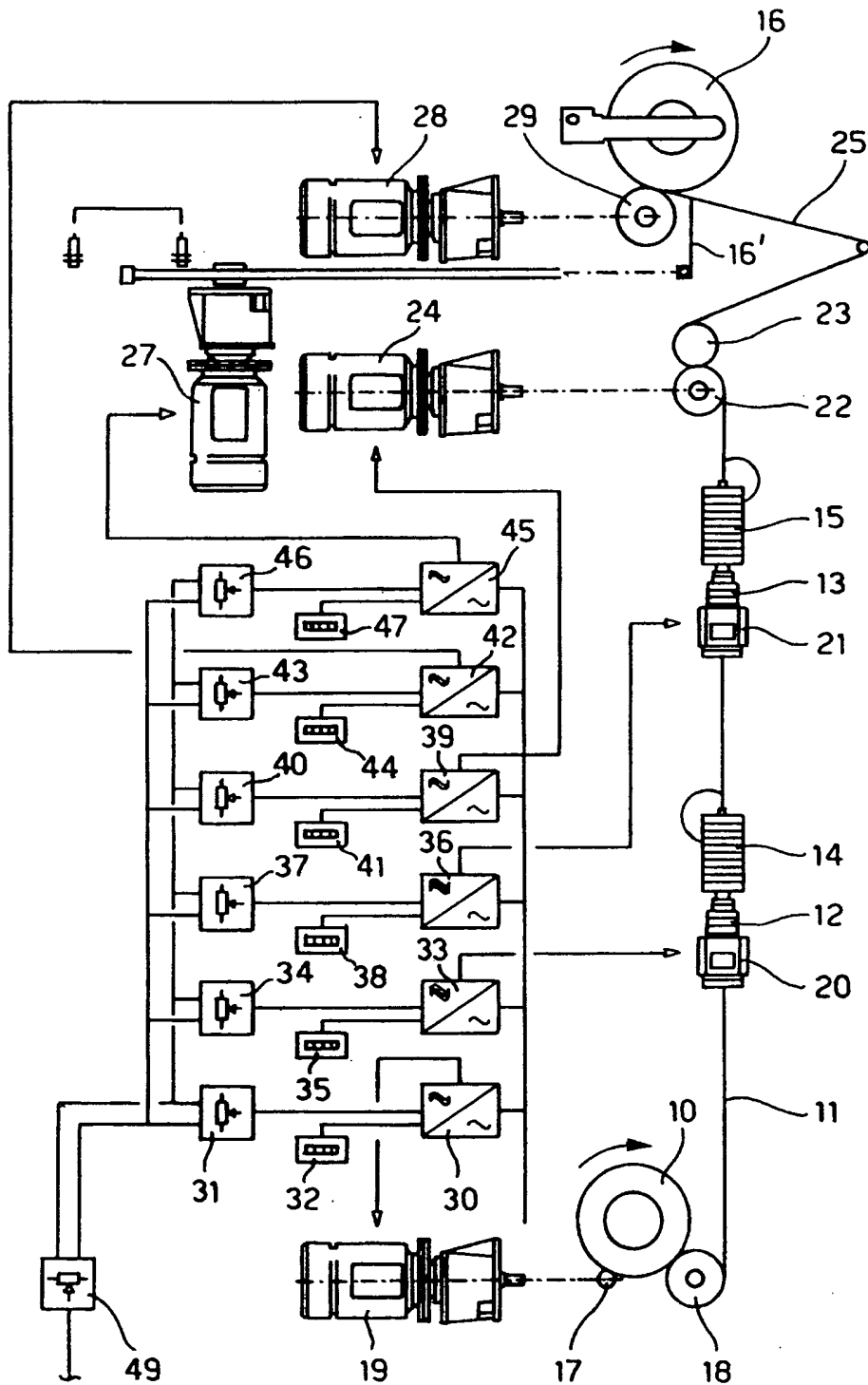


FIG. 1

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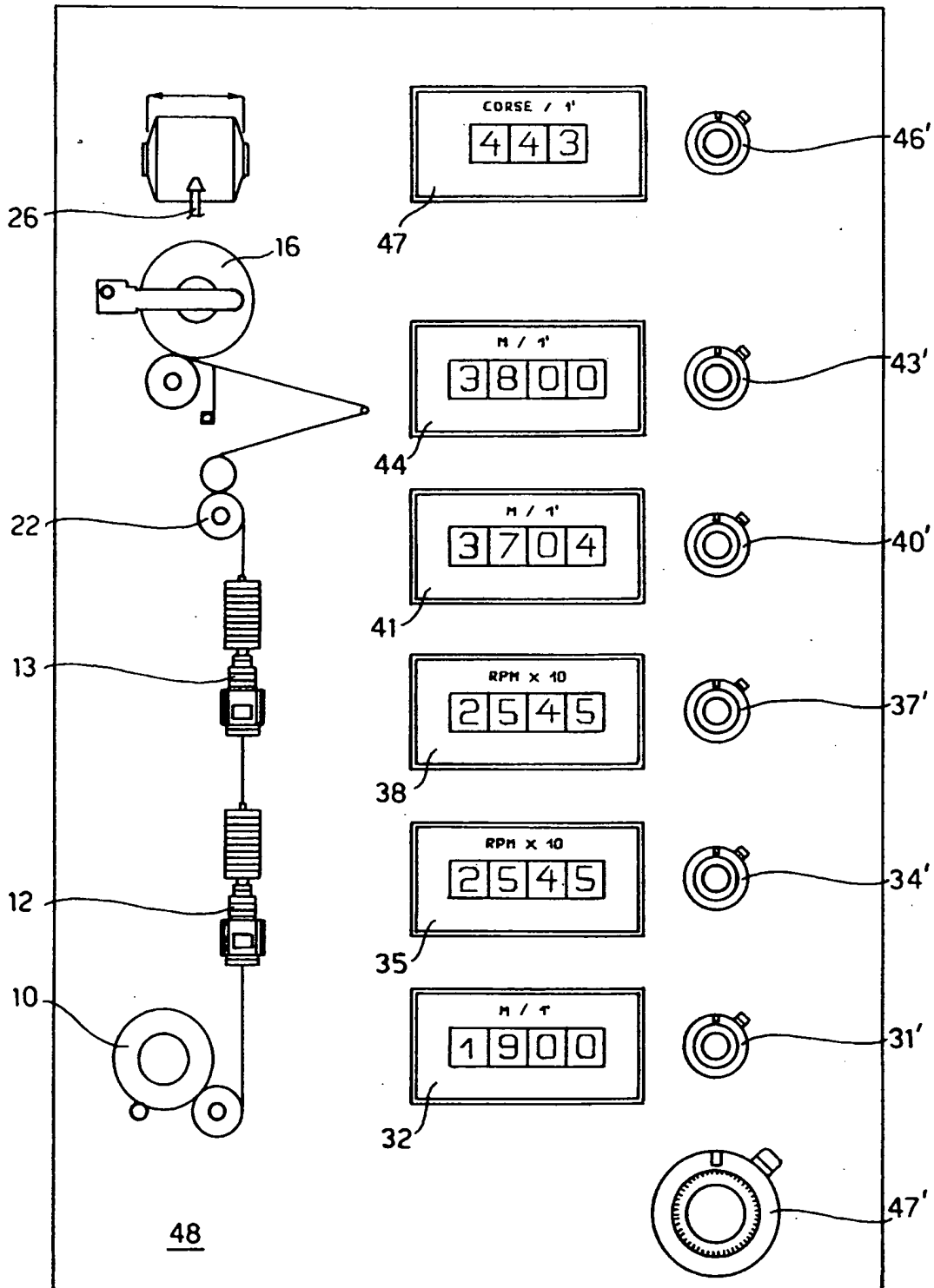


FIG. 2

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## EUROPEAN SEARCH REPORT

Application Number

EP 91 11 2426

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE-A-1 817 020 (MOULINAGE ET RETORDERIE DE CHAVANDZ S.A.) * page 5, line 16 - page 6, line 8; figures 1,8 *	1,2	D02G3/38
A	US-A-4 772 825 (TABOR ET AL) * column 1, line 43 - column 2, line 50; claims 1,7; figure 1 *	1,2	
A,D	US-A-4 197 696 (BOCK) * abstract; figures 1,2 *	1,2	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D02G D01H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 18 NOVEMBER 1991	Examiner TAMME H. -M. N.
<b>CATEGORY OF CITED DOCUMENTS</b>			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons * : member of the same patent family, corresponding document	

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